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Zoological Results of the British Speleological Expedition to Papua New Guinea, 1975. A note on the characters and status of the genus *Caloma* Chamberlin, 1945 (Polydesmida: Paradoxosomatidae)

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ABSTRACT

The heretofore enigmatic milliped *Caloma agametum* Chamberlin, 1945, is redescribed and illustrated from the holotype and a second male from the central highlands of New Guinea. The genus appers to be referable to the tribe Sulciferini, within which distinguished, *inter alia*, by the presence of a large hyaline plate on the dorsal (coxal) side of the gonopod femur as well as by small structural details of the tibiotarsal region. The species described by Silvestri in 1899 as *Atropisoma insulatre* is very similar to *agametum* in gonopod structure and herein transferred to *Caloma*.

Investigation of the paradoxosomatid fauna of the Papuan region, inherently difficult from the refractory nature of the subject matter itself, has been severely impeded by the publication of two papers by R. V. Chamberlin (1920, 1945) in which many new names were proposed for local species without adequate documentation. Over the years, most of the new Chamberlinian genera have been identified by deduction, re-examination of his type material, or of specimens that seemed to represent his perceptions; virtually all have been shown to be junior synonyms of well-established names. There is no evidence that Professor Chamberlin invested much time in consultation of available literature resources.

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One nominal taxon which has so far evaded a careful scrutiny is *Caloma,* proposed in 1945 for the single species *C. agametum.* The original verbal diagnosis briefly described the structure of the gonopods, and one of them was illustrated as seen *in situ.* While the drawing is accurate, it is small and generalized and the aspect precludes comparison with figures of other taxa made from the conventional mesal side. Jeekel's magisterial survey of the Paradoxosomatidae (1968) included *Caloma* under the heading "Incertae sedis" with the comment "The gonopod drawing published by Chamberlin shows clearly that this genus cannot be placed in the Aschistodesmini, the Eustrongylosomatini, or the Tectoporini, but it is insufficiently detailed to evaluate the position of the genus." It maintained the same status in my 1980 "Classification" and to my knowledge has not subsequently appeared in print.

As a participant in the 1975 British Speleological Expedition to the high central mountains of Papua New Guinea, Dr. Petar Beron was able to assemble substantial collections of epigaean millipeds which came to my hand for processing and eventual description. By good fortune, one of Dr. Beron's samples happened to contain males of a small species, the gonopods of which seemed to match the Chamberlinian sketch closely. With this incentive, I appealed to Dr. Norman Platnick (AMNH) for loan of the type specimen, and was gratified to confirm specific identity of the two specimens. It is now possible to provide an amplified account of the characters of *Caloma* and finally remove this genus from the category of dubious taxa and refer it to a tribe with some degree of confidence.

Tribe SULCIFERINI

Sulciferinae Attems, 1898, Denks. Akad. Wien, 67: 345.– Jeekel, 1968, Paradoxosomatidae, p. 120, 128 -- Hoffman, 1980, Classification of the Diplopoda, p. 170.

The difficulties in defining paradoxosomatid tribes unambiguously are made evident in Jeekel's essay on the subject (1968: 120-129), with the observation that "the circumscription of the various tribes as defined in the preceeding chapters is still incongruous." This is particularly true for those which lack some easily observed trait like the basal torsion of the telopodite in the Eviulisomatini. Some tribes are recognized – if not defined – by the traits of their component genera, some of which may lack an autapomorphic feature but generally agree otherwise with those so endowed .A clear line between Sulciferini and Tectoporini seems especially hard to distinguish.

For the present, *Caloma* is very tentatively referred to the Sulciferini because of similarities of its gonopod structure with what is seen in, e.g., *Oxidus*; this allocation enjoys the endorsement of Dr. Jeekel. One objection to be raised, however, is the

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Figs. 1-4. Peripheral details, *Caloma agametum*. 1. Two midbody segments in lateral aspect. 2. Segments 19 and epiproct, dorsal aspect. 3. Sternum asnd leg bases, segent 5, aboral aspect showing median sternal process. 4. Ventral side of segment 7, showing appearance of gonopod aperture.

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large geographic disjunction between *Caloma* and the essential confinement of sulciferine genera to the mainland of southeast Asia. In this context, biogeography tends to support a placement in the Tectoporini. Obviously, the problem is still far from resolution.

The taxonomy of the group is also difficult because the distal part of the gonotelopodite is often strongly torsate and the various processes nearly transparent and closely applied, making correct interpretation and illustration of the structure very laborious. Additional problems have been imposed by the publication of totally inadequate drawings and referral of supposedly new species to nominal new genera without careful background studies. In any event, some insights are emerging and eventual comprehension of the group is ever nearer at hand.

Caloma.

Caloma Chamberlin, 1945, American Mus. Nov., 1282: 14. Proposed with a new species. Type species, *C. agametum* Chamberlin, by original designation and monotypy.

DIAGNOSIS: A genus of Sulciferini distinguished by a prominent postfemoral flange (a) which encircles the telopodite to the mesal side, where its free edge merges into the short straight process (b) that supports the distal half of the solenomere (c). Femoral region with a prominent, hyaline lamina (d) on the dorsolateral side, its free edge lying laterad to the coxa.

Paranota relatively small, dorsum convex between them, ozopores open in small lateral pit near apical end. Stricture sharply defined, without pits or costulations. Anterior legs unmodified. Sternum of segment 5 with prominent erecct, setose process between legs of anterior pair. Gonopod aperture small, transverse, with only a minute median projection on anterior edge.

AFFINITIES: At present, I have no insights concerning the relationships of the genus.

RANGE: New Guinea, from sea level to above 3000 meters in the central mountain ranges.

SPECIES: Two.

Caloma agametum.

Figures 1-9.

Caloma agametum Chamberlin, 1945, Amer. Mus. Nov. 1282: 14, fig. 64. Male holotype (AMNH) from Prauwenbivak, "North New Guinea", November-December 1920, W. C. Van Heurn, leg.

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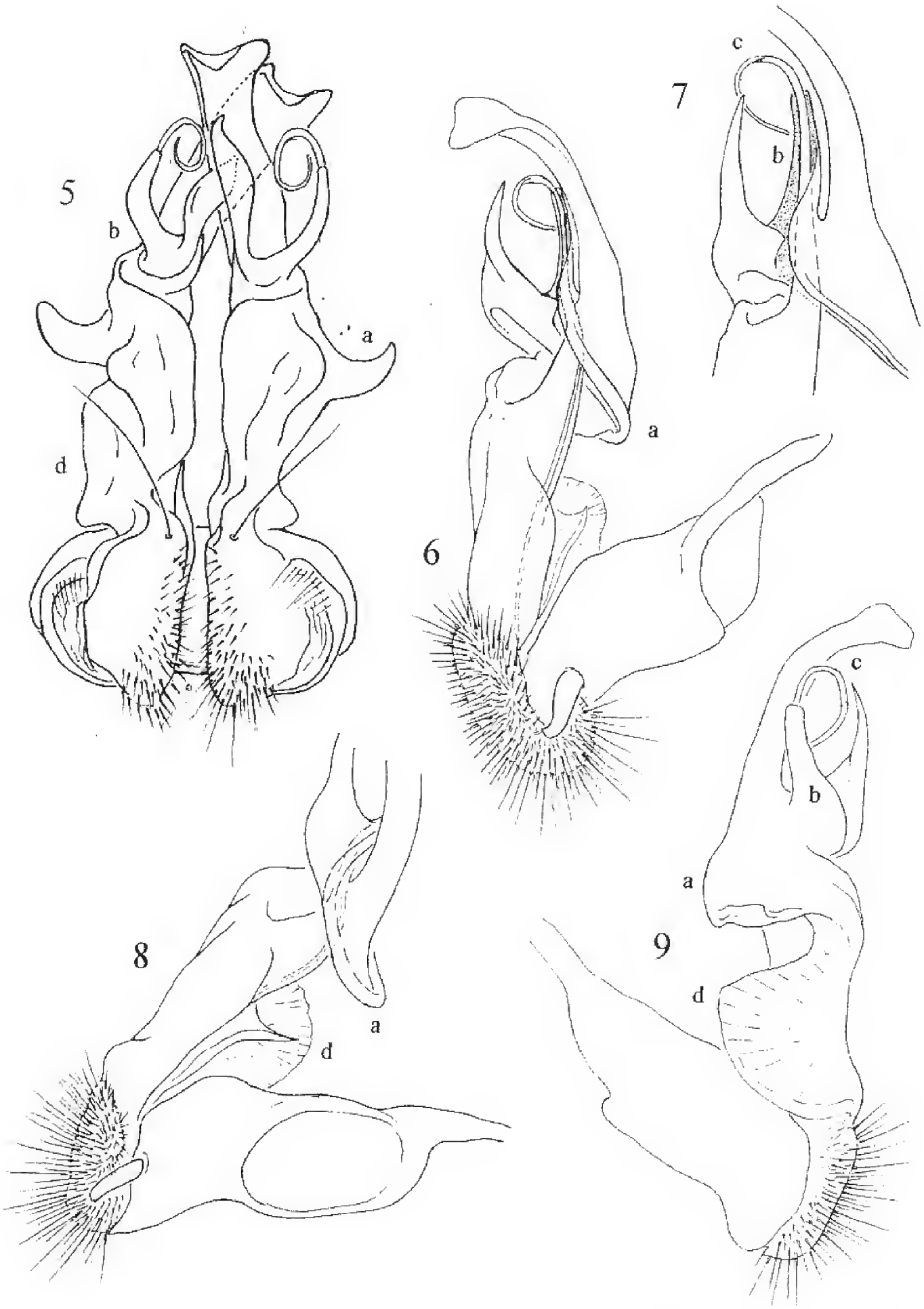

Figs. 5-9. Gonopod structure, *Caloma agametum*. 5. Both gonopods as seen *in situ*. 6. Right gonopod, mesal aspect. 7. Base of postfemoral region, submesal aspect, enlarged for clarity. 8. Right gonopod, a more oblique mesal aspect to emphasize the femoral lamella. 9. Right gonopod, lateral aspect.

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MATERIAL: Holotype male (AMNH); also one male (VMNH) from PAPUA NEW GUINEA: Western Province, Finim tel, 35 km WSW of Telefomin [5.10S, 141.35E], 2300 m., 2 September 1975, P. Beron leg.

DISCUSSION: As seen in ventral aspect (Fig. 5) the gonopods of this species appear rather disjunct but the mesal aspect presents a more conventional structure that can be recognized in other genera of Sulciferini The postfemoral elements are dominated by the large ?tibiotarsus (a) which is widely flared laterad (Fig. 5), with its free edge rebordered for much of its length. This modification initially convinced me that it conducted the long solenomere around in a 180° torsion (as in, e.g., *Helicorthomorpha*), and only prolonged examination using a fine needle showed the error of this impression: the solenomere simply runs directly distad against the "conductor" process (b) as shown in Fig. 7. In part, however, it is overlapped by the edge of flange a, contributing to my initial misinterpretation. The primary element of the postfemur is curved ventrad and is apically bifid although that is evident only in ventral aspect and not in mesal or lateral views.

The most compelling claim to generic recognition is made, however, by the striking femoral lamina (d), a thin, transparent projection with a high median carina on its medial surface (Fig. 8, d). This is not to be confused with the femoral expansion that occurs in, e.g., *Nedyopus*, involving the entire dorsal surface of the region.

Prauwenbivak is not shown on most large scale maps of New Guinea. Dr. Jeekel kindly provided me with its location at 3.15S, 138.35E, thus ca 40 km SSW of Sukarnapura, West Irian. This locality is of interest in establishing the species some 250 km northwest of, and at a considerably lower elevation than, the Telefomin site, a substantial range for a tropical milliped..

Caloma insulare (Silvestri), new combination

Fig. 10

Atropisoma insulare Silvestri, 1899, Termés. Füzetek., 22: 207, figs. 13, 14. ♂♀ syntypes (Hungarian Nat. Hist. Mus.) , from *"Ins. Tamara* (Berlinhafen)", L. Biró leg. – Attems, 1914, Arch. Naturg., A4: 80: 217. – Attems, 1937, Das Tierreich, 68: 222, fig. 280.

Silvestri's illustration of the gonopod, obviously made from a microscope preparation, is unusually detailed for its time and provides not only confident generic placement, but species-level characters as well. Reproduced here as Fig. 10, the drawing shows even such details as the thin carina on the median surface of the femoral lamina. Comparison with Fig. 6 shows, however, a number of differences from *agametum* in details of size and proportion of the postfemoral elements.

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"Berlinhafen" [Berlin Harbour on some maps] is now called *Aitape*, at 142.35E, 3.13S, a settlement on the coast of North Sepik District, Papua New Guinea.

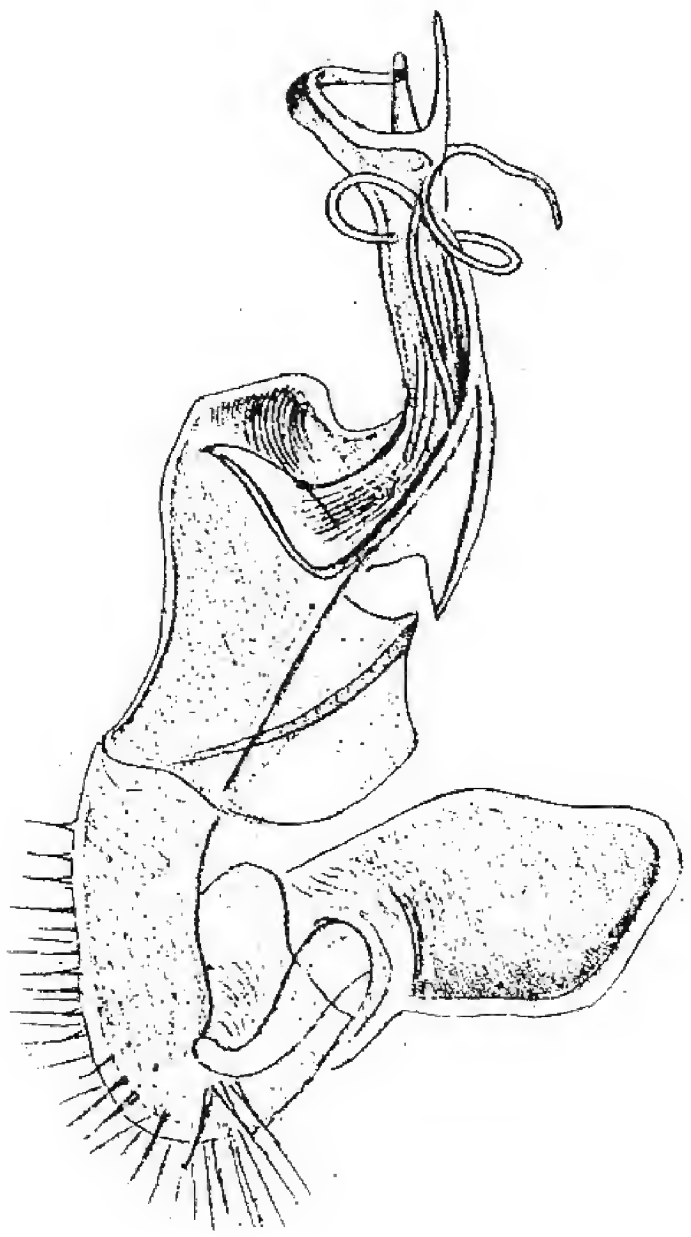

Fig. 10. *Caloma insulare* (Silvestri). Right gonopod, mesal aspect. From Silvestri 1899, some lines enhanced.

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